

Nurture groups: a large-scale, controlled study of effects on development and academic attainment

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Nurture groups have contributed to inclusive practices in primary schools in the UK for some time now and have frequently been the subject of articles in this journal. This large-scale, controlled study of nurture groups across 32 schools in the City of Glasgow provides further evidence for their effectiveness in addressing the emotional development and behaviour problems of vulnerable children. In particular, Sue Reynolds, Principal Educational Psychologist, Maura Kearney, Senior Educational Psychologist, both working in Glasgow City Council Psychological Services, and Tommy MacKay, Professor at the University of Strathclyde and Director of Psychology Consultancy Services, suggest that is the first study to report quantitative gains in academic achievement when the progress of pupils in nurture groups is compared with that of matched children in mainstream classes. This highlights the importance of providing a nurturing context as a basis for promoting children's learning.

Key words: emotional development, behaviour problems, academic achievement.

Introduction: the rationale and resurgence of nurture groups

For the past few years Glasgow City Council has implemented an early intervention strategy which has resulted in the creation of 58 nurture groups across the city. Although the earliest nurture groups were set up in 1970 by Marjorie Boxall, an educational psychologist with Inner London Education Authority (Bennathan & Boxall, 2000), it is only in recent years that a significant evidence base has begun to emerge in the academic literature. This has highlighted a number of outstanding research issues, some of which are addressed in this large-scale, controlled study across 32 primary schools in Glasgow.

The first nurture groups were established in response to the large number of vulnerable children entering school – that is, children who had significant emotional and behavioural difficulties and who were unable to meet the expectations and demands of an ordinary nursery or infant class. It was Boxall's view that the problems these children faced in their development and behaviour arose from impoverished early nurturing, leading to difficulties in forming trusting relationships with adults or responding appropriately to their peers. Bowlby's (1969, 1973, 1980) work on attachment provided the theoretical underpinnings of the intervention, and

nurture groups reflected the social and cultural values associated with this theoretical foundation, as did the various assessment instruments developed to evaluate them. They were established with the intention of tackling emotional and behavioural issues at an early stage, rather than having to deal with them once they had become entrenched. This was done by providing those children who had been identified as having the appropriate profile with the majority of their teaching in a small class within their mainstream primary school. Class size was typically up to a maximum of 10 or 12 pupils, and the class was staffed by both a specially trained nurture group teacher and an auxiliary.

This setting is designed to offer a nurturing environment in which children can experience an increased sense of security and self-worth and be supported in their social and emotional development. The nurture group aims to offer an experience based on carefully planned routines in which there is a balance of affection and structure and of learning and teaching. The group provides many of the experiences generally found in the home environment, with a focus on activities that are not part of normal classroom life, such as sitting down together for breakfast and enjoying activities that may be developmentally appropriate for younger children, but that may have been lacking in the experience of the children in the group. Strong links are maintained with mainstream peers. The children in the nurture group register with their class each morning and join it to participate in specified activities.

The early success of the nurture groups in supporting children with difficulties in mainstream schools (Bennathan & Boxall, 1996) led them to spread throughout Inner London and other authorities, with around 50 groups operating by the late 1970s (O'Connor & Colwell, 2002). Official endorsement was provided by the Warnock Committee on special educational needs, which was:

'impressed by the "nurture groups" which have been started in a number of primary schools in London for children approaching or over the age of five who are socially and emotionally affected by severe deprivation in early childhood'.

(DES, 1978, para. 5.30)

However, the Warnock Committee itself was a major catalyst in the advance of fully inclusive practice, and subsequent years saw a progressive move away from extracting pupils from mainstream classes for special or remedial education. Also, many nurture groups were discontinued

following the abolition of the Inner London Education Authority, and by the late 1990s a national survey reported fewer than 50 groups in the UK (Cooper, Arnold & Boyd, 1999).

However, it was also the late 1990s that marked the resurgence of interest in nurture groups, and the last decade has seen significant growth in the number of groups to around 1,000 (Nurture Group Network, 2008) and also in the academic literature supporting them. In the ERIC database only four journal articles on nurture groups are listed in the period from the 1970s up to the late 1990s, while there are 18 entries for the period from 1999 onwards. Several reasons may be proposed for this resurgence. First, the starting point was a textbook on nurture groups by Bennathan and Boxall (1996), the original workers in this field. Second, the nurture groups running in Enfield through the 1980s and 1990s, which were evaluated by Iszatt and Wasilewska (1997), were given national prominence as a case study in good practice in the Government's Green Paper, *Excellence for All Children: meeting special educational needs* (DfEE, 1997). Third, there was increasing recognition of the extent of mental health issues in children and the importance of these in relation to emotional and behavioural development (Meltzer, Gartward, Goodman & Ford, 2000). Fourth, there was an increased interest in attachment theory, marked by the establishment in 1999 of a major international journal entitled *Attachment and Human Development*. Fifth, there were school factors, among which Cooper and Whitebread (2007) have listed the rise in school exclusions, the negative effects on educational practices that followed from the 1988 Education Reform Act in England and Wales and an increase in emotional and behavioural difficulties. All of this provided a context in which nurture groups were well placed to make a significant contribution.

Research evidence and its limitations

All of the published research on nurture groups has indicated beneficial effects. These may be summarised under four headings: emotional/behavioural effects, cognitive/educational effects, teacher/school effects and support needs/school placement effects.

Emotional/behavioural effects are most commonly reported, as might be expected from an intervention aimed at addressing the needs of children showing difficulties in their emotional and behavioural development, but few studies have used control groups. O'Connor and Colwell (2002) reported gains on all 20 sub-strands of the Boxall Profile (Bennathan & Boxall, 1998, 2000) for 68 children in nurture groups in five schools. While the general trend of progress was still apparent on follow-up two years after leaving the groups, the results were less clear. In addition, by that time there were only 12 of the children available for assessment, and without a comparison group it is not possible to separate nurture group effects from time effects. In an earlier pilot study of nurture groups in Glasgow, Gerrard (2005) also reported gains for 108 children in 13 schools using the Boxall Profile and for 133 children in 15 schools using the Goodman Strengths and Difficulties Questionnaire (SDQ) (Goodman,

1997, 1999). There was no control group, but it was noted that gains were not shown on either of these instruments for a small sample of 11 children with difficulties attending two schools without nurture groups. Similarly, gains were found for 36 children attending nurture groups for four mornings each week in six schools (Binnie & Allen, 2008). The measures used were the Boxall Profile, the SDQ and the Behavioural Indicators of Self-Esteem Scale (BIOS) (Burnett, 1998), supported by questionnaires to staff and parents.

Two studies have reported emotional/behavioural gains in comparison with control groups. In a small-scale study, Sanders (2007) found gains on Boxall Profile scores for 17 pupils in nurture groups in one school compared with nine controls in another school. However, as the controls had higher entry scores the validity of the comparison was limited. Specifically, the differential impact on higher pre-test scores of regression to the mean at post-test was not controlled for (Zhang & Tomblin, 2003). The largest study (Cooper & Whitebread, 2007) was a further follow-up to ongoing research (Cooper, Arnold & Boyd, 2001; Cooper & Tiknaz, 2005) which has charted the progress of pupils in 34 schools with nurture groups across 11 education authorities. A sample of 359 children in nurture groups was compared with 184 children in four control groups (with or without emotional and behavioural difficulties in schools with or without nurture groups). Using the Boxall Profile and the SDQ they found improvements in social, emotional and behavioural functioning. Gains continued across four school terms, but attrition rates were very high, with a loss of two-thirds (239) of the original nurture group sample.

In terms of cognitive/educational effects, no study has reported any firm data. Cooper and Whitebread (2007) refer to improvements associated with 'cognitive engagement in learning tasks'. However, this was not based on a direct cognitive or educational measure but on gain scores for pupils in nurture groups over time in one of the strands on the Boxall Profile, 'organisation of experience', which includes a range of features such as 'participates constructively', 'connects up experiences' and 'engages cognitively with peers'. No comparisons for children in the control groups were made on this measure and it is therefore not possible to isolate nurture group effects from general improvements over time. Sanders (2007) noted that two-thirds of staff ratings on a pupil assessment form indicated academic gains, with children better motivated to complete academic tasks and appearing able to work independently. Similarly, Binnie and Allen (2008) refer to academic progress. However, again there were no controls and in addition no formal measures, but simply that two-thirds of teachers had responded positively to a question on whether children had shown some level of academic progress while attending the groups.

The effects on teachers and schools of nurture groups and the approaches they use has been subject to very little formal evaluation, but several studies refer to positive findings. Teacher perceptions on questionnaires or on interview have

indicated improved school ethos and increased capacity to support children (Binnie & Allen, 2008), together with better behaviour management practice, more adaptation of teaching approaches and less likelihood of staff absence and turnover (Sanders, 2007). Better outcomes for mainstream pupils with emotional and behavioural difficulties in schools with nurture groups compared with other schools were viewed by Cooper and Whitebread (2007) as evidence for the contributions the groups make to fostering a 'nurturing school'. Doyle (2001, 2004) has developed this at case study level by importing nurture group principles into mainstream classroom practice. These include a focus on the development of social skills, of self-awareness and confidence and of self-control and behaviour management.

Support needs/school placement effects were reported by Iszatt and Wasilewska (1997) in a study of 308 children who had attended six nurture groups in Enfield. In less than one year 87% of those in the nurture groups were able to return to mainstream classes. On follow-up several years later, 83% of the original sample were still in mainstream placements, with only 4% requiring additional support beyond the school's normal resources. Comparison with a small control group of 20 children with similar needs indicated 45% requiring additional support and 35% requiring special educational placement. Sanders (2007) also reported teachers' views that there were improvements for children attending nurture groups in terms of fewer permanent exclusions and better attendance.

In summary, there is therefore a basis for optimism across a wide range of studies regarding the beneficial effects of nurture groups. Caution in the interpretation of these results is nevertheless required owing to the limitations which have been noted and which may be summarised as follows. First, there are methodological weaknesses, and studies are frequently characterised by small samples, lack of controls, poor sample selection, absence of quantitative measures of change and high attrition rates. Second, evaluation of the longer-term outcomes of nurture groups is limited, and findings suggest that while many of the initial benefits are maintained, the groups may not benefit all children and there is sometimes evidence of relapse in areas of social and emotional functioning (O'Connor & Colwell, 2002). Third, there is lack of information regarding a number of confounding factors, such as the impact of class size and of teacher behaviour. These cautions are of particular importance since the setting up of nurture groups, especially on a large scale, has significant implications in terms of resources and staff training.

Research aims and hypotheses

The current limitations in the evidence for nurture groups are clear. In particular, no controlled studies of academic effects using quantitative measures have been reported. This study sought to address some of the limitations that have been described. It aimed to be large-scale, with a sample drawn from 32 schools, of which 16 were matched controls. In particular, the matching process for selection of control schools and pupils was highly formalised. Also, it assessed

emotional/behavioural changes and effects on academic attainments using quantitative assessment measures.

Two hypotheses were proposed: first, that children in nurture groups would show improvements in their emotional/behavioural functioning on all measures in comparison with controls; second, that they would also show comparative improvements in their academic attainments.

Method

Participants

The sample comprised 221 pupils (142 boys, 79 girls) attending 32 primary schools in the Glasgow City Council area. Of these, 117 attended nurture groups in 16 schools, while 104 attended 16 matched schools without nurture groups. Ages ranged from five to seven years, with 126 pupils in Primary 1 and 95 in Primary 2 (that is, the first two stages in the Scottish primary school system).

Selection of schools and pupils

Because of the marked differences between nurture group and control samples in the very few reported studies that have included control groups, this study adopted a highly formalised procedure for selecting controls. While this did not eliminate the almost unavoidable differences between experimentals and controls in a quasi-experimental study, it was successful in significantly reducing any differences.

A three-stage process for selection was followed. When the study was commissioned, 58 nurture groups had already been established in Glasgow. The first stage in selection was to divide all of the 166 primary schools in the city into bands based on two factors: number of pupils on the roll and socio-economic status. The latter was determined on the basis of an aggregate figure used by the Chief Executive's department and included eligibility for free school meals and for clothing grants. Each of the 58 schools with nurture groups was then linked where possible to one or more potential control schools in the same band. For the second stage every pupil in Primary 1 and Primary 2 in all 166 schools was assessed using precise ratings on an audit of need designed for the study (Figure 1). This resulted in the identification of 16 schools that were a close match for schools with nurture groups in terms of the school criteria in stage one and the pupil criteria in stage two. For the third stage, the pupils in the control schools and in the schools with nurture groups were assessed on the Boxall Profile and controls were selected if they sufficiently matched the profile of the pupils in nurture groups. Although this strict selection procedure reduced the potential experimental sample from 58 to 16 schools, it was felt to be better to have good matching rather than to select the 58 control schools that provided the 'next best match', since without question the needs of pupils in these additional schools would not have been as severe as those in the schools the Council selected for nurture groups.

Measures

A range of quantitative measures was used to assess change in academic attainments and emotional/behavioural functioning. These were the Baseline Assessment for Early

Figure 1: Audit of need for sample selection

The audit was based on ratings of pupils on seven strands:	
1	care basis (for example, looked after and accommodated, looked after, on child protection register);
2	parental support (for example, illness, care issues, depression, attendance, time-keeping, addiction, parental literacy, divorce, separation);
3	additional support needs (for example, sensory impairment, physical impairment, fine/gross motor delay, speech and language delay);
4	poor self-concept (for example, self-esteem, confidence, resilience, being withdrawn);
5	pre-school experience (for example, interrupted or lack of attendance);
6	early/deferred entry to school (for example, January/February birthdays);
7	emotional/behavioural difficulties (for example, isolation, selective mutism, ability to follow routines, turn-taking, sharing, emotional literacy, acting out – hitting, swearing, pushing, and so on).

Literacy (MacKay, 1999, 2006), the Boxall Profile, the Strengths and Difficulties Questionnaire (SDQ) and the Behavioural Indicators of Self-Esteem (BIOS). A brief description of each follows. Children were assessed at two points, time 1 (pre-test) and time 2 (post-test). The interval between time 1 and time 2 was six months.

Baseline Assessment for Early Literacy

Basic literacy skills were selected as a key indicator of progress in academic attainments. The baseline assessment has high levels of reliability and validity (MacKay, 2006). It measures early reading readiness and literacy skills and is a highly sensitive instrument for measuring changes in performance. It consists of four subsections: concepts of print, phonological awareness, early reading skills and developmental tasks. It has the advantage of being directly relevant to the curriculum and requires little or no training to administer. In addition, it allows the class teacher to continue to track progress after the nurture group and provides a basis for planning the child's next educational steps. In order to ensure impartiality, the pre-post assessments were carried out by independent assessors employed by Glasgow City Council for this purpose.

Boxall Profile

This is a detailed normative diagnostic instrument which can be used to measure level of emotional and behavioural functioning and to highlight targets for intervention. The profile is divided into two main parts (Figure 2), the first dealing with developmental factors affecting the child's ability to engage effectively in the learning process, and the second with behavioural characteristics which may inhibit or interfere with social and academic performance. This was carried out by the class teacher or nurture group teacher. The use of these staff was necessary since this part of the assessment required detailed knowledge of the child at a level that only the child's own teacher would be able to provide.

SDQ

This is a 25-item quantitative measure of children's behavioural functioning consisting of five subscales. Four of these

Figure 2: The Boxall Profile: developmental and diagnostic strands

Developmental strands	
1. Organisation of experience	<ul style="list-style-type: none">• gives purposeful attention;• participates constructively;• connects up experiences;• shows insightful involvement;• engages cognitively with peers.
2. Internalisation of controls	<ul style="list-style-type: none">• is emotionally secure;• is biddable and accepts constraints;• accommodates others;• responds constructively to others;• maintains internalised standards.
Diagnostic strands	
1. Self-limiting features	<ul style="list-style-type: none">• disengaged;• self-negating.
2. Undeveloped behaviour	<ul style="list-style-type: none">• makes undifferentiated attachments;• shows inconsequential behaviour.
3. Unsupported development	<ul style="list-style-type: none">• avoids/rejects attachment;• has undeveloped/insecure sense of self;• shows negativism towards self;• shows negativism towards others;• wants, grabs, disregards others.

(hyperactivity, conduct problems, emotional symptoms, peer problems) yield a 'total difficulties' score while the fifth provides a score for pro-social behaviour. It has been found to produce results consistent with more established behaviour rating scales, such as Achenbach's Child Behaviour Checklist, and Rutter's Child Behaviour Rating Scale (Goodman, 1999). This was carried out by the class teacher or nurture group teacher, again because detailed knowledge of the child was required.

BIOS

This instrument provides teachers with a means of observing and recording the frequency of behaviours indicative of self-esteem. It consists of 13 statements relating to the child's observed behaviour over the previous two weeks, and has good levels of validity and reliability (Burnett, 1998). This was carried out by the class teacher or nurture group teacher, and again this was because the person completing the assessment needed to have detailed knowledge of the child.

Data analysis

The data were analysed using a 2×2 ANCOVA. The post-test score from the baseline assessment, the five components of the Boxall Profile, the SDQ scores ('total difficulties' and 'pro-social') and the BIOS score were the dependent variables, with the equivalent pre-test score as co-variable. In each case, school stage (Primary 1 or Primary 2) and group (nurture group or control group) were used as independent variables. Given the number of variables being compared and therefore the increased likelihood of a Type 1 error, a Bonferroni adjustment was used to raise the level at which results would be accepted as

statistically significant to $p < 0.005$. Finally, a stepwise multiple regression was carried out to assess the contribution of the factors in the emotional/behavioural assessments (Boxall Profile, SDQ and BIOS) to change scores on the baseline assessment. All analyses were conducted using SPSS for Windows version 16.0.

Results

As no significant effects were found for primary school stage or for interaction between primary school stage and nurture group v. control group results, all of the ANCOVAs were carried out on the entire sample, with no further breakdown according to whether the children were at Primary 1 or Primary 2 stage. The number of children participating in each analysis is shown. This varies, as pre-post data were not available for all of the sample.

Academic attainments

Children attending nurture groups showed significant gains in academic attainments as measured by their total scores on the baseline assessment ($p < 0.001$). The results are shown in Table 1.

Table 1: Academic attainments: nurture group v. controls. Analysis of co-variance

N = 186	Time 1 mean	Time 2 mean	Level of F	Significance
Nurture groups (N = 94)	54.90	81.60	13.332	$p < 0.001$
Controls (N = 92)	61.66	78.05		

In order to explore further the significant improvements in academic attainments found for children attending nurture groups, a stepwise multiple regression was carried out in which the change in baseline scores was the criterion variable and the change scores for each of the measures on the Boxall Profile, the SDQ and the BIOS were the predictor variables. The resultant model highlighted one variable as the best predictor of educational improvement, the Boxall strand of 'unsupported development'. This accounted for almost a quarter of the variance ($\beta = -0.226$, $t = -2.798$, $p = 0.006$). Together with two other Boxall strands, 'organisa-

tion of experience' ($\beta = 0.151$) and 'internalisation of controls' ($\beta = 0.135$), these factors accounted for just over half of the variance in baseline assessment improvements.

Emotional/behavioural change

On the Boxall Profile, significant benefits were found for the nurture groups in comparison with the controls on all five strands, with significance levels ranging from $p = 0.003$ to $p < 0.001$. It should be noted that a higher score indicates improvement for the two strands 'organisation of experience' and 'internalisation of controls', while a lower score indicates improvement for the three strands 'self-limiting features', 'undeveloped behaviour' and 'unsupported development'. The results are shown in Table 2.

On the SDQ, while the trend of the scores was in the right direction, the results did not reach significance levels either for 'total difficulties' or for 'pro-social behaviour'. In the latter case a value of $p = 0.013$ was rejected because of the strict level at which the Bonferroni adjustment was set in order to avoid a Type 1 error arising by chance from the relatively large number (nine) of analyses being carried out. It should be noted that on the SDQ improvements are indicated by a lower score on 'total difficulties' but by a higher score on 'pro-social behaviour'. The results are shown in Table 3.

On the BIOS, significant benefits were found for the nurture groups v. controls ($p = 0.001$). The results are shown in Table 4.

Discussion

This large-scale, controlled study has used quantitative measures not only of emotional/behavioural factors but also of academic attainments to compare the progress of children in nurture groups with a carefully matched sample attending mainstream classes in schools without nurture groups. Its results have provided further evidence of the effectiveness of nurture groups in relation to improvements in emotional and behavioural functioning, with significant gains on almost every measure used. In addition, this study has demonstrated quantitative gains in academic attainments for pupils in nurture groups.

Nurture groups are grounded in attachment theory (Ben-nathan & Boxall, 2000), and they represent a clearly targeted intervention for addressing the emotional and behavioural

Table 2: Emotional/behavioural change – Boxall Profile: nurture groups v. controls. Analysis of co-variance

Boxall strand (N = 180)	Nurture groups (N = 97)		Controls (N = 83)		Level of F	Significance
	Time 1 mean	Time 2 mean	Time 1 mean	Time 2 mean		
Organisation of experience	8.22	10.71	8.97	9.69	29.486	$p < 0.001$
Internalisation of controls	7.97	9.71	8.85	9.41	12.328	$p < 0.001$
Self-limiting features	4.56	3.06	4.19	3.80	9.023	$p = 0.003$
Undeveloped behaviour	3.83	2.46	2.74	2.74	15.411	$p < 0.001$
Unsupported development	4.10	2.94	3.32	3.34	12.356	$p = 0.001$

Table 3: Emotional/behavioural change – SDQ: nurture groups v. controls. Analysis of co-variance

SDQ (N = 190)	Nurture groups (N = 98)		Controls (N = 92)		Level of F	Significance
	Time 1 mean	Time 2 mean	Time 1 mean	Time 2 mean		
Total difficulties score	16.83	13.83	14.62	14.21	2.709	<i>ns</i>
Pro-social behaviour	4.34	5.71	4.92	5.22	6.373	<i>p</i> = 0.013 <i>ns</i> *

Note: * Acceptable probability level set at $p < 0.005$ for Bonferroni adjustment.

Table 4: Emotional/behavioural change – BIOS: nurture groups v. controls. Analysis of co-variance

N = 185	Time 1 mean	Time 2 mean	Level of F	Significance
Nurture groups (N = 99)	38.81	44.53	10.493	<i>p</i> = 0.001
Controls (N = 86)	36.31	38.79		

issues of children with major difficulties in the development of secure attachments. Possible relationships between attachment and academic outcomes have been demonstrated in several studies of children and young people of various ages (see, for example, Jacobsen & Hofmann, 1997; Marcus & Sanders-Reio, 2001; Moss & St-Laurent, 2001). The effectiveness of nurture groups in providing a context that enhances academic attainment is clearly of considerable importance for schools.

We would cautiously suggest that the stepwise multiple regression reported in this study provides a further indication of the significance of attachment to academic attainment. It highlighted three factors, all of them in the Boxall Profile, which together predicted over 50% of the variance in academic gains. The main predictor was improvement in 'unsupported development'. High scores on this factor are postulated as suggesting 'a profound lack of early nurturing care' leading to negative experiences and poor development of attachment (Bennathan & Boxall, 1998). The other two predictors were 'organisation of experience' and 'internalisation of controls'. The former of these two predictors describes a child who appears 'organised, attentive and interested, and is involved purposefully and constructively in events, people and ideas' (Bennathan & Boxall, 1998). The latter describes the child who appears 'emotionally secure, makes constructive, adaptive relationships, is able to co-operate with others, and has internalised the controls necessary for social functioning' (Bennathan & Boxall, 1998).

Overall the implication is that nurture groups, in applying Bowlby's work on attachment to an educational context, provide a theoretical and practical foundation for addressing the emotional/behavioural and academic needs of the most vulnerable children. This may be an important pointer to further research on class size and on the effects of introducing nurturing principles into mainstream classes. Smaller class sizes offer benefits to vulnerable children in their first

year at school (Blatchford, Martin, Moriarty, Bassett & Goldstein, 2002), and provide a context in which such children are more likely to be the focus of the teacher's attention rather than just be 'one of the crowd' (Blatchford, Bassett, Brown, Martin & Russell, 2004). Also, apart from class size, teachers in mainstream classes act in less 'nurturing' ways than teachers in nurture groups. Colwell and O'Connor (2003) found that the teachers in the nurture groups had a more nurturing approach. Their verbal and non-verbal communications were much more positive and more likely to enhance the self-esteem of the pupils. However, it does not seem likely that the most needy children will benefit either by simply being in classes of the same size as nurture groups without receiving what these groups specifically offer, or by being in large mainstream classes that take a nurturing approach.

This study was subject to a number of limitations in its methodology and outcomes. In relation to methodology, it was not possible to conduct a randomised controlled trial. As in most education authorities, many practical considerations governed the decision as to whether it was possible or appropriate to set up a nurture group in a particular school. It is therefore acknowledged that there may have been a number of factors, whether related to the schools themselves or otherwise, influencing the Council's choice, and the researchers had to find matched controls for the schools the Council had selected. However, the matching of schools and children was carried out to a high specification in order to minimise pre-test differences as much as possible.

Also, as with every study in this field, it was not practicable to set up any blind assessment procedures. It is noted further that the assessment procedures selected, such as the Boxall Profile, require judgements on the part of teachers on matters such as level of 'emotional security' and maintenance of 'internal standards'. In addition, there was a marked attrition rate because of absence of children at points

of pre-post assessment and limited resources to ensure that every teacher completed all of the necessary measures. In relation to outcomes, the study to date has been able to look only at outcomes in the relatively short term, but data are not yet available to inform longer-term conclusions. It has not been possible to elucidate which variables are associated with the success of nurture groups, such as the effect of small class size or differences in teacher behaviour between nurture groups and mainstream classes. Also, while using quantitative assessment measures, no measures were used at this stage in the study to allow triangulation with structured teacher or pupil feedback (these are the subject of follow-up studies). Positive views of a sample of parents whose children participated in the study are reported separately (March & Healy, 2007).

These limitations, together with those identified among the research studies in general, provide pointers for the future of nurture group research.

Conclusions: the future of nurture group research

This large-scale, controlled study across 32 schools in the City of Glasgow has strengthened the evidence base for nurture groups as an intervention that has been shown on a range of standardised measures to have beneficial effects on children's social, emotional and behavioural development. In doing so, it has pointed to the possible significance of attachment theory as a factor in the gains that have been made. In addition, it is the first study to use quantitative assessment measures to demonstrate improved levels of academic attainment in children attending nurture groups.

Nevertheless, it is our view that the evidence for the benefits of nurture groups, although it has been provided by over 20 studies, is not yet sufficiently robust that it could be the subject of systematic review. The existing studies continue to be marked by significant methodological limitations, and these give clear pointers for the future of nurture group research and to the need for caution in assessing benefits.

First, it is necessary to carry out large-scale, randomised controlled trials. To date, the most rigorous large-scale studies, including the Glasgow study reported here, have been quasi-experimental. That is, after the nurture groups have already been agreed or established for particular schools, matched controls have been sought in other classes in the same schools or in schools without nurture groups. The result is that it has not yet been possible to control for school effects in terms of prior differences between those with and those without nurture groups. The significance of this point is clearly demonstrated in Cooper and Whitebread's (2007) study. In showing benefits for pupils with emotional and behavioural difficulties in mainstream classes in schools with as opposed to those without nurture groups, they state that there may have been antecedent conditions, such as 'state of readiness' and 'a philosophical bias' towards the nurture group approach (Cooper and Whitebread, 2007). There is, therefore, a crucial need for random

assignment both of matched schools and of matched children so that a proper comparison of all conditions can be made.

Second, it is necessary to explore the possibility of setting up studies that incorporate blind assessment procedures. This represents a particular challenge, not only in terms of the logistics of ensuring that an assessor is unaware of whether a particular child had or had not attended a nurture group, but also in including assessment measures that are not crucially dependent on the detailed knowledge of the child held only by the class teacher or nurture group teacher.

Third, there is a need for studies with greater statistical rigour. For example, although there are controlled studies reporting over 20 *t* tests (see, for example, O'Connor & Colwell, 2002; Cooper & Whitebread, 2007; Sanders, 2007), we know of no study that has used Bonferroni corrections. Also, many of the studies have no controls (see, for example, O'Connor & Colwell, 2002; Binnie & Allen, 2008) and therefore rely totally on pre-post gains scores. However, while positive results are reported, it is not possible to make an accurate assessment of other factors such as the effect of normal development in the interval between tests.

Fourth, there is a need for more studies using quantitative instruments to measure effects, especially in relation to academic attainments. Prior to the current study, there were no reports of the direct effects of nurture groups on attainment other than general perceptions of teachers as to whether they thought the children had made some amount of academic progress during the time they were in the groups (see, for example, Binnie & Allen, 2008).

Fifth, it is necessary for further work to be done on the effect of class size. While there is much research on this topic as a general issue, there are no systematic comparisons between children in nurture groups and matched children attending classes restricted to the same size but without using the nurture group principles.

Sixth, there is a need to look more systematically at the possible benefits of instilling nurture group principles into regular mainstream classes. The likely significance of nurturing principles has been highlighted (see, for example, Lucas, 1999; Colwell & O'Connor, 2003; Doyle, 2004), but controlled trials are needed.

Finally, research is needed on the operation and structure of nurture groups. For example, Cooper and Whitebread (2007) have identified different models ranging from the classic Boxall nurture group to groups with different structures but informed by the same principles, and Binnie and Allen (2008) have considered the issue of groups that operate on a more part-time basis. Other researchers have investigated alternatives to nurture groups where attendance at different types of facilities offering emotional and behavioural support is much less frequent or for a shorter duration

(see, for example, King & Chantler, 2002; Renwick & Spalding, 2002; Cullen-Powell & Barlow, 2005). In addition, there is little data to inform decisions about the age range or types of difficulty for which a nurture group is most likely to be helpful. If nurture groups are a beneficial intervention, it is necessary to isolate and assess their key ingredients in order to inform future best practice.

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